

Patent Application 09/819,740
Docket No. P14585US

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method for performing mobility management in a communication network, said method comprising the steps of:

establishing a connection between a mobile station and a first service node in the communication network;

extending the established connection from the first service node to a terminal node in the communication network;

upon an establishment of a tunneled Point-to-Point Protocol (PPP) connection between the mobile station and the terminal node via the first service node, assigning at the terminal node a unique address to the mobile station, said address associated with the mobile station and the tunneled PPP connection established between the mobile station and the terminal node via the first service node; and

upon roaming of the mobile station connected to the first service node from the coverage area of the first service node to the coverage area of a second service node in the communication network, ensuring continuous connectivity between the mobile station and the terminal node by:

establishing a new connection between the mobile station and the second service node;

extending the established new connection from the second service node to the terminal node;

verifying at the terminal node whether the unique address assigned to the mobile station is associated with a prior connection with the terminal node via the first service node; and

upon determining that the unique address assigned to the mobile station is associated with a prior connection with the terminal node via the first service node, reassigning at the terminal node the unique address to the mobile station upon an establishment of a new tunneled PPP connection between the mobile station and the terminal node via the second service node, said address associated with the mobile station and the new tunneled PPP connection established between the mobile station and the terminal node via the second service node; and

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terminating the tunneled PPP connection between the mobile station and the terminal node via the first service node, whereby performing mobility management for the mobile station in the communication network.

2. (Original) The method as in claim 1, wherein mobility management provides services to the mobile station in accordance with the level of quality to which the mobile station has subscribed to, regardless of its position in the communication network.

3. (Original) The method as in claim 1, wherein the service nodes can consist of any network element such as a router, a switch or a cellular telecommunication service node.

4. (Original) The method as in claim 1, wherein the coverage area of the service nodes can be the coverage area of any network element such as a router, a switch or a cellular telecommunication service node.

5. (Original) The method as in claim 1, wherein the communication network can be one of a cellular telecommunication network, a data network, an internet network or a private network.

6. (Original) The method as in claim 1, wherein the extending of the established connection from the service nodes to the terminal node is performed by:

acquiring at the service nodes at least one parameter for establishing a connection between the service nodes and the terminal node; and

establishing the connection between the service nodes and the terminal node in accordance with the at least one acquired parameter.

7. (Original) The method as in claim 6, wherein the at least one parameter is acquired from a database in the communication network.

8. (Original) The method as in claim 7, wherein the database is co-located with the terminal node in the communication network.

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9. (Original) The method as in claim 7, wherein the database is co-located with one of the service nodes in the communication network.

10. (Original) The method as in claim 6, wherein the at least one parameter can be one of a connection type parameter, a server endpoint address and a connection assignment identification number.

11. (Original) The method as in claim 1, wherein the verifying step is performed by querying a database in the communication network.

12. (Original) The method as in claim 11, wherein the database is co-located with the terminal node.

13. (Original) The method as in claim 11, wherein the database is co-located with one of the service nodes in the communication network.

14. (Original) The method as in claim 11, wherein the database includes at least one parameter such as a mobile identification number, a mobile station address, a username, a password, a connection type parameter, a server endpoint address and a connection assignment identification number.

15. (Currently amended) The method as in claim 1, wherein:

the mobile station accesses the communication network over an air interface in accordance with the CDMA2000 protocol;

the communication network is a cellular telecommunication network that supports the ~~Simple IP~~ Simple IP protocol;

the establishment of the connection from the service node to the terminal node is performed in accordance with L2TP tunneling protocol;

the connections are Point-to-Point Protocol (PPP) connections;

the addresses are IP addresses; and

the service nodes are Packet Data Service Nodes.

16. (Currently amended) A system for allowing mobility management for a mobile station in a communication network, said system comprising:

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a first service node having a first coverage area, the first service node having communications capability for establishing a connection with the mobile station;

a second service node having a second coverage area, the second service node having communications capability for establishing a new connection with the mobile station upon roaming of the mobile station from the coverage area of the first service node into the coverage area of the second service node; and

a terminal node comprising communications capability for establishing connections with the first and second service nodes; and

an addressing module for:

assigning a unique address to the mobile station upon establishment of a tunneled Point-to-Point Protocol (PPP) connection between the mobile station and the terminal node via the first service node; and

verifying whether, upon establishment of a new tunneled PPP connection between the mobile station and the terminal node via the second service node, the mobile station already has assigned thereto the unique address for the connection via the first service node, and if so reassigning the unique address to the mobile station for the new tunneled PPP connection established to the terminal node via the second service node.

17. (Original) The system as in claim 16, wherein mobility management provides services to the mobile station in accordance with the level of quality the mobile station has subscribed to, regardless of its position in the communication network.

18. (Original) The system as in claim 16, wherein the service nodes can consist of any communication network element such as a router, a switch or a cellular telecommunication service node.

19. (Original) The system as in claim 16, wherein the coverage area of the service nodes can be the coverage area of any communication network such as a router, a switch or a cellular telecommunication service node.

20. (Original) The system as in claim 16, wherein the communication network can be one of a cellular telecommunication network, a data network, an internet network or a private network.

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21. (Original) The system as in claim 16, wherein the service nodes acquire at least one parameter for establishing a connection with the terminal node in accordance with said at least one acquired parameter.

22. (Original) The system as in claim 21, wherein the at least one parameter is acquired from a database in the communication network.

23. (Original) The system as in claim 22, wherein the database is co-located with one of the service nodes.

24. (Original) The system as in claim 22, wherein the database is co-located with the terminal node.

25. (Original) The system as in claim 21, wherein the at least one parameter can be one of a connection type parameter, a server endpoint address and a connection assignment identification number.

26. (Currently amended) The system as in claim 16, wherein the addressing module assigns a unique address to the mobile station by:

first querying a database to verify if the mobile station's unique address is stored in the database and associated with a previous tunneled PPP connection to the terminal node; and

if so, reassigning the unique address to the mobile station or otherwise obtaining a new address selected from a pool of unassigned addresses stored in the database and assigning the new address to the mobile station.

27. (Original) The system as in claim 26, wherein the database is co-located with one of the service nodes.

28. (Original) The system as in claim 26, wherein the database is co-located with the terminal node.

29. (Original) The system as in claim 26, wherein the database includes at least one parameter such as a mobile identification number, a mobile station address, a

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username, a password, a connection type parameter, a server endpoint address and a connection assignment identification number.

30. (Currently amended) The system as in claim 16, wherein:

the mobile station accesses the communication network over an air interface in accordance with the CDMA2000 protocol;

the communication network is a cellular telecommunication network that supports the SimpleIP Simple IP protocol;

the establishment of the connection from the service node to the terminal node is performed in accordance with L2TP tunneling protocol;

the connections are Point-to-Point Protocol (PPP) connections;

the addresses are IP addresses; and

the service nodes are Packet Data Service Nodes.

31. (Currently amended) A terminal node for communicating with a mobile station via first and second service nodes, the first service node having a first coverage area and communications capability for establishing a connection with the mobile station, the second service node having a second coverage area and communications capability for establishing a new connection with the mobile station upon roaming of the mobile station from the coverage area of the first service node into the coverage area of the second service node, the terminal node comprising:

communications capability for establishing connections with the first and second service nodes;

an addressing module for:

assigning a unique address to the mobile station upon establishment of a tunneled Point-to-Point Protocol (PPP) connection between the mobile station and the terminal node via the first service node; and

verifying whether, upon establishment of a new tunneled PPP connection between the mobile station and the terminal node via the second service node, the mobile station already has assigned thereto the unique address for the connection via the first service node, and if so reassigning the unique address to the mobile station for the new tunneled PPP connection established to the terminal node via the second service node.

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32. (Original) The terminal node as in claim 31, wherein the service nodes can consist of any network element such as a router, a switch or a cellular telecommunication service node.

33. (Original) The terminal node as in claim 31, wherein the coverage area of the service nodes can be the coverage area of any network element such as a router, a switch or a cellular telecommunication service node.

34. (Original) The terminal node as in claim 31, comprising: a PPP stack for establishing and terminating connections with the mobile station; assigning the unique address to the mobile station; and a L2TP stack for establishing and terminating connections with the service nodes in accordance with at least one acquired parameter.

35. (Original) The terminal node as in claim 34, wherein the at least one parameter is acquired from a database in the communication network.

36. (Original) The terminal node as in claim 35, wherein the database is co-located with one of the service nodes.

37. (Original) The terminal node as in claim 35, wherein the database is co-located with the terminal node.

38. (Original) The terminal node as in claim 35, wherein the database includes at least one parameter such as a mobile identification number, a mobile station address, a username, a password, a connection type parameter, a server endpoint address and a connection assignment identification number.

39. (Currently amended) The terminal node as in claim 31, wherein:
the terminal node establishes a connection with a mobile station accessing a communication network over an air interface in accordance with the CDMA2000 protocol;
the terminal node is in a cellular telecommunication network that supports the SimpleIP Simple IP protocol;
the establishment of the connection from the service nodes to the terminal node is performed in accordance with L2TP tunneling protocol;

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the connections are Point-to-Point Protocol (PPP) connections;
the addresses are IP addresses; and
the service nodes are Packet Data Service Nodes.